In the Figures:

Please include the attached FIGURES 2, 3A, 3B, and 4, with the previously submitted FIGURE 1 that was filed on February 5, 2002.

In the Specification:

Page 3, Line 5: Please add the following to the Brief Description of the Drawings, after the description of FIGURE 1, at page 3 line 5 of the Specification:

FIGURE 2 is a symbolic cross-section of the dual drive for hydraulic pump and air compressor, with indirect drive.

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FIGURE 3A is a symbolic cross-section of the dual drive for hydraulic pump and air compressor, with reduction gears.

FIGURE 3B is a symbolic cross-section of the dual drive for hydraulic pump and air conditioning air compressor with a harmonic drive.

In FIGURE 4 is a dual drive for hydraulic pump and air compressor incorporated in an aircraft.

Page 5, Line 17: Please add to the Specification above the last paragraph of page 5 at line 17 the following:

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It will be appreciated that varying configurations of the present invention suitably permit the invention to be used, for example, in confined spaces. In FIGURE 2 an exemplary embodiment of the present invention includes a reversible motor 110 indirectly driving a main shaft 114. The motor 110 has a shaft 112 driving the main shaft 114 through a pair of meshing gears 170. The main shaft 114 is linked through a first overrunning clutch 120 to a shaft 132 driving a hydraulic pump 130. The main shaft 114 is also linked to a second overrunning clutch 122 linked to a second subsystem shaft 142 driving an air compressor 140. The system 105 permits flexible physical configuration of the present invention as the motor 110 driving the main shaft 114 may be positioned laterally from or at angles to the main shaft 114.

The present invention may also incorporate gearing that changes the output speeds and torque provided to subsystems driven by the invention. In FIGURE 3A an exemplary system 205 includes a reversible motor 210. The motor 210 drives a main shaft 212 projecting from two ends of the motor 210. One end of the shaft 212 drives a first overrunning clutch/gear system

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Seattle, Washington 98104
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221. When the motor 210 operates in a clockwise direction the first clutch/gear system 221 engages. The first clutch/gear system 221 includes an overrunning clutch 223 and a reducing gear set 225 driving a first shaft 232 driving a hydraulic pump 230.

At the opposite end of the main shaft 212, a second overrunning clutch/gear system 222 includes a second overrunning clutch 224 which engages when the main shaft 212 operates in a counter-clockwise direction. When the second overrunning clutch 224 engages it drives a second gear set 226. The second gear set 226 drives a second shaft 242 which in turn drives an air compressor 240. Thus, the system 205 suitably may provide a variety of output speeds and torques to the two subsystems driven by the system 205, in this instance a hydraulic pump 230 and an air compressor 240.

It will be appreciated that harmonic drive gear sets may suitably be utilized advantageously incorporating lightweight and co-axial gearing into a system of the present invention. In FIGURE 3B an exemplary system 305 of the present invention includes a reversible motor 310 driving a main shaft 312 exiting both ends of the motor 310. The main shaft 312 at one end engages an overrunning clutch 320 when the main shaft operates in a clockwise direction. The first overrunning clutch 320 when engaged then drives a first output shaft 332 driving a hydraulic pump 330.

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At the opposite end of the main shaft 312 the main shaft drives an overrunning clutch/gear system 322 including a second overrunning clutch 324, and a harmonic drive 326. The second overrunning clutch 324 engages when the main shaft 312 operates in a counter-clockwise direction. When the second overrunning clutch 324 is engaged it drives the harmonic drive 326 by driving the input wave generator 327 of the harmonic drive 326. The wave generator 327 engages an intermediate flex spline 328 in a known manner, which in turn engages the circular spline or output spline 329 of the harmonic drive 326. This gears down output of the main shaft 312 to a reduced speed at the second output shaft 342 driven by the output spline 329. The second output shaft 342 in turn in this embodiment drives an air compressor 340. It will be appreciated that the harmonic drive 326 advantageously permits the main shaft 312 to be co-axial with the second output shaft 342 even as the output of the second output shaft 312 is geared down through the harmonic drive 326.

The present invention can be incorporated into aircraft, thereby advantageously providing weight reduction and flexibility in driving aircraft subsystems. In FIGURE 4 an exemplary system 405 of the present invention is suitably incorporated into an aircraft and drives a hydraulic pump 430 and an air cycle machine 440 for air-conditioning. The system 405 suitably includes a reversible motor 410 driving a main shaft 412 that projects from both ends of the motor 410. At one end the shaft 412 drives a first overrunning clutch/gear system 421 including

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a first overrunning clutch 423 that engages when the main shaft 412 rotates in a counter-clockwise direction driving a harmonic drive 425. Output from the harmonic drive 425 drives the hydraulic pump 430. Hydraulic pressure from the hydraulic pump 430 suitably may be used to drive various aircraft subsystems such as flap drive motors 434, or landing gear drive motors (not shown). At the other end the main shaft 412 connects with a second overrunning clutch 424 that engages when the main shaft 412 operates in a clockwise direction. When the second overrunning clutch 424 engages, the main shaft 412 drives an air cycle machine for air-conditioning including two air compressors 441 linked to each other to take air from an input 447, compress the air, cool the air, then re-expand the air further cooling the air, resulting in air-conditioned air output 445 for use in the aircraft 400. In this exemplary embodiment, in the manner described in connection with FIGURE 1, the system 405 also includes a second single direction motor 460 also linked to the air cycle machine for air cooling 410. The second motor 460 drives the air cycle machine 440 through a second input shaft 462 co-axial with the main shaft 412 as described above in reference to FIGURE 1. The second motor 460 suitably may power the air cycle machine for air-conditioning 440 even when the reversible motor 410 is operating in an opposite direction driving the hydraulic pump 430.

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Page 4, Line 10: 'Motor 10' should read 'motor 60':

FIGURE 1 shows an embodiment of the present invention with a second drive motor 60. The second drive motor 60 has an output shaft 62 in line with and, through intervening components, connected to the main shaft 12 of the reversible motor 10. In a presently preferred embodiment, the second drive motor shaft 62 is connected to and drives a second stage air compressor 50. The second stage air compressor 50 has a second stage inlet 52, and a second stage outlet 54. The second stage air compressor 50 is linked by a common shaft 64 to the air compressor 40. In an alternative embodiment, the second drive ~~motor 10~~ <u>motor 60</u> through its drive shaft 62 may be connected directly to the air compressor 40. In a presently preferred embodiment, as shown in FIGURE 1, the air compressor 40, and the second stage air compressor 50 form part of an air cycle machine for air conditioning an aircraft. In a presently preferred embodiment, the common shaft 64 is a quill shaft link to the main shaft 12 through the air compressor 40.

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Page 4, Line 23: Change 'two air turbine air compressors 40 and 50' to 'two air compressors 40 and 50':

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In the embodiment shown in FIGURE 1, the second drive motor 60 is a nonreversible electric motor. When operating, the second drive motor 60 provides a base level of power to the air compressors 40 and 50 even when the reversible drive motor 10 is reversed and providing power to the hydraulic pump 30. Otherwise, both the reversible drive motor 10 and the second drive motor 60 provide combined power directly to the air compressors 40 and 50 while the hydraulic pump 30 is at rest, with the clockwise over-running clutch 20 freewheeling. In a presently preferred embodiment, as shown in FIGURE 1, when utilized in an aircraft, the second drive motor 60 runs constantly, providing a base level of air conditioning power through the ~~two air turbine air compressors 40 and 50~~ two air compressors 40 and 50. For most of the on-ground and in-flight operational period for the aircraft, the reversible drive motor 10 provides power to the air conditioning system of the aircraft through air compressors 40 and 50. During periods when substantial hydraulic power is required, such as for raising and lowering the landing gear, or extending or retracting flaps, the reversible motor 10 is reversed, driving the hydraulic pump 30 for the limited periods of time those systems are in operation, temporarily reducing power to the aircraft air conditioning system.

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